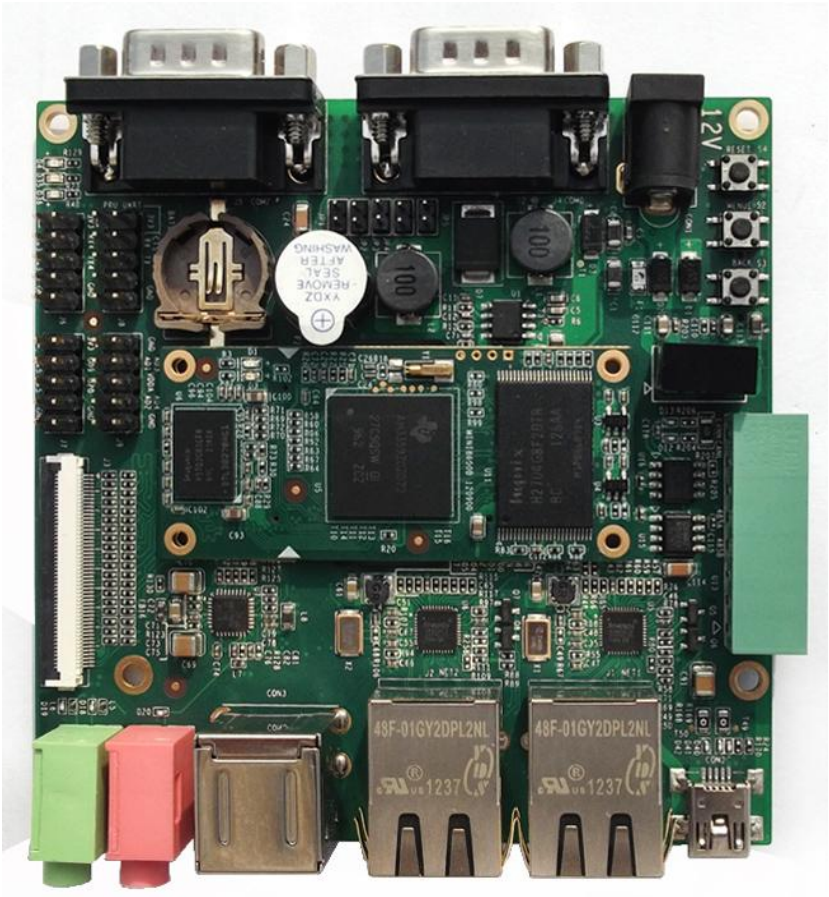
SBC8600B

Single Board Computer



Quick Start Guide

Version 1.1

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Embest
A Premier Farnell Company

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1 Product Overview

The primary purpose of this document is to give users an overview of the software and hardware development environment of the SBC8600B, and to help the user to start their development or to learn faster.

This document will cover the following points:

- Where to find the useful contents for different requirements;
- Packing list and DVD contents;
- Default configuration of software and hardware of the Single Board Computer;
- Building a development environment for the Single Board Computer quickly;
- Booting up Linux/wince/Android operating systems quickly.

SBC8100 Plus Optional Modules List:

Names	Linux	Android	WinCE	Relevant Materials
VGA8000	YES	YES	YES	Available in DVD-ROM
WF8000-U	YES	NO	NO	Available in DVD-ROM
CAM8100-U	YES	NO	NO	Available in DVD-ROM
CDMA8000-U	YES	NO	NO	Download
WCDMA8000-U	YES	NO	NO	Download
LVDS8000	YES	YES	YES	Available in DVD-ROM and on website

2 Quick Start Guide

This section contains several tables that indicate where to find the useful contents for different requirements, so users may get to work quickly!

2.1 For Hardware Development:

Item	Description	Location
Hardware system	Introduces CPU, peripheral chips and hardware interfaces	User Manual
CPU Datasheet	Shows principles and configuration of AM3359x	DVD
Schematic of SBC8600B	Contains hardware principles of SBC8600B	DVD
Dimensions of SBC8600B	The actual dimensions of SBC8600B used to aid in manufacturing	User Manual

2.2 For Software Development:

Item	Description	Location
Preparations for testing	Connecting external devices, setting up HyperTerminal and booting up the system	Quick Start Guide
Testing functionalities of interfaces	Testing the interfaces on the board via an operating system	User Manual
DEMO demonstration	Establish a demonstration system (Android, TISDK)	User Manual
Establish developing and compilation environment	Linux development and compilation environment	User Manual
	Windows Embedded Compact 7 development and compilation environment	User Manual
Recompile system image	Recompiling Linux system image	User Manual
	Recompiling Windows Embedded Compact 7 system image	User Manual
Software	Introduction to Linux drivers and related driver	User Manual

development	development processes	
	Introduction to Windows Embedded Compact 7 drivers and related driver development processes	User Manual
StarterWare	Describes bare-metal programming and example execution	DVD

2.3 For Marketing:

Item	Description	Location
Hardware system	CPU features and information about on-board interfaces	User Manual
Software of Linux / Windows Embedded Compact 7	Teaches basic Linux software components and features, and the purpose of the compilation tool	User Manual
	Teaches about the basic software components of Windows Embedded Compact 7 and their features, and the purpose of the compilation tool	User Manual
Dimensional drawing of SBC8600B	The actual dimensions of SBC8600B used to aid in manufacturing	User Manual
DEMO demonstration	Establish a demonstration system (Android, TISDK)	User Manual

2.4 For Learning:

It is recommended to read each part of this Manual from the beginning to the end.

2.5 Kit Contents

- ✓ SBC8600B Single Board Computer（with Mini8600B）
- ✓ Serial Cable (DB9-DB9)
- ✓ 12V, 1.25A Power Adapter
- ✓ Crossover Cable
- ✓ **Optional** 4.3” LCD display screen or 7” display screen (with touch screen)
- ✓ **DVD/CD including:**
  - SBC8600B Quick Operation Manual
  - SBC8600B User Manual
  - SBC8600B Starterware User Manual
  - Schematic Diagram of SBC8600B Hardware, Board Carrier Chip Datasheet
  - Development Kit of SBC8600B Software （Linux/WinCE/Android/Starterware）

3 Establishing a Development Environment

3.1 Establishment of Hardware Environment

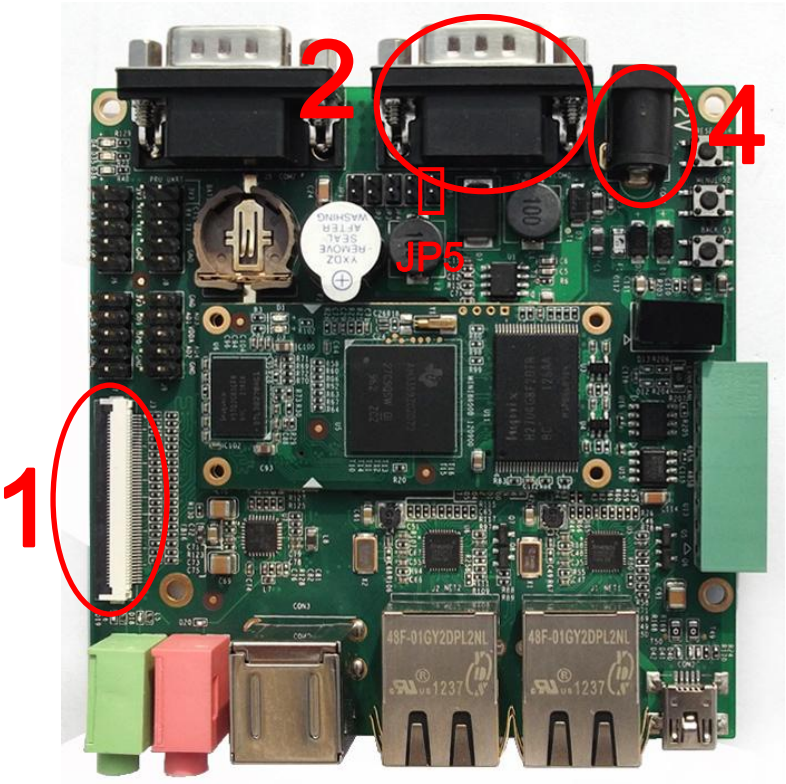


Figure 1: SBC8600B Hardware Connections

Please establish the hardware environment according to the following steps:

1. Connect Touch-Screen LCD
2. Connect your 4.3-inch/7-inch touch-screen LCD to the LCD interface, and keep the blue side of the FPC cable up
3. Connect Serial Ports
4. Use serial cable to connect the PC serial port to the debugger serial port of SBC8600B.
5. If you want to boot from a TF card, you need to short the jumper JP5
6. Connect the 12V power adapter to the evaluation board

3.2 Establishment of Software Environment

3.2.1 Preparation of Windows XP System Environment

Before powering up SBC8600B, you need to configure HyperTerminal on the PC, follow the process below in order to setup a Hyper Terminal connection:

1. From the desktop click:

- Start
- All Programs
- Accessories
- Communication
- Hyper Terminal

As shown in the following image:

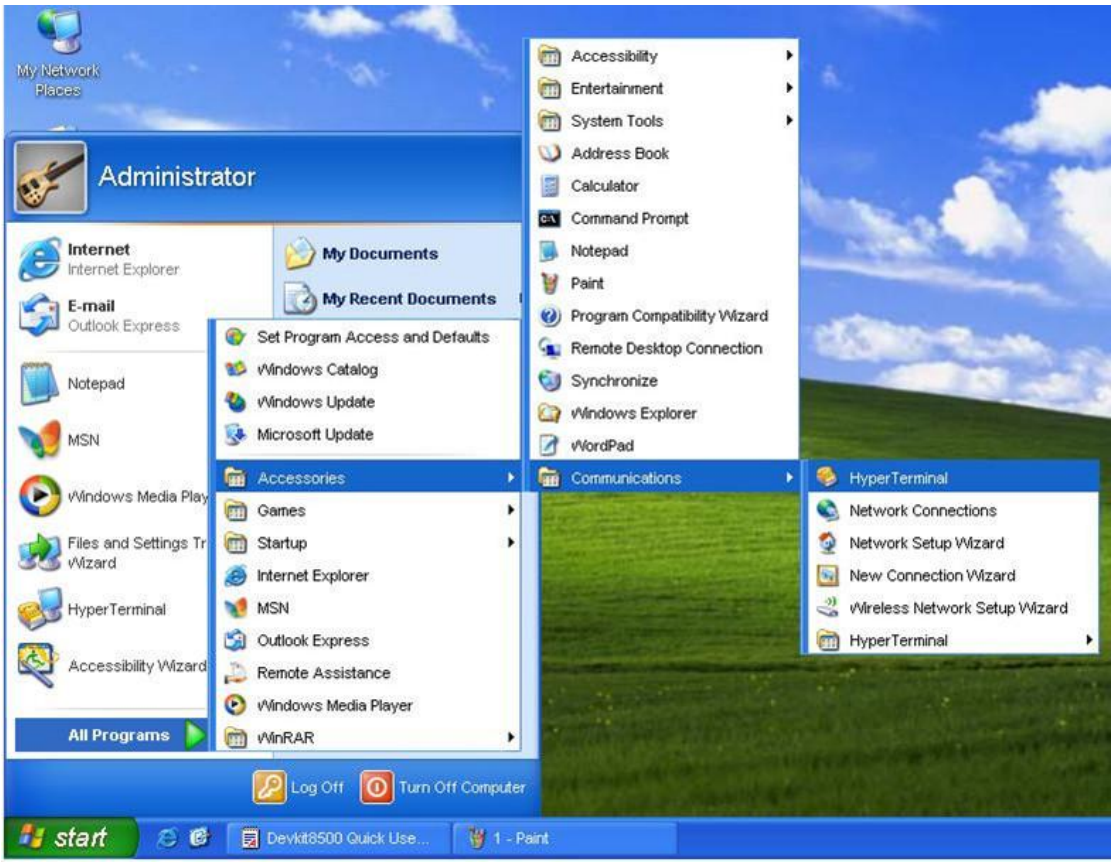


Figure 2: HyperTerminal Location on Windows XP

2. Establish a new HyperTerminal connection:

Figure 3: Setting HyperTerminal Connection Name & Icon

3. Select the specific serial port from the list as per your computers COM port configuration:

Figure 4: HyperTerminal COM Port Settings

4. Set parameters for the serial port connection as follows:

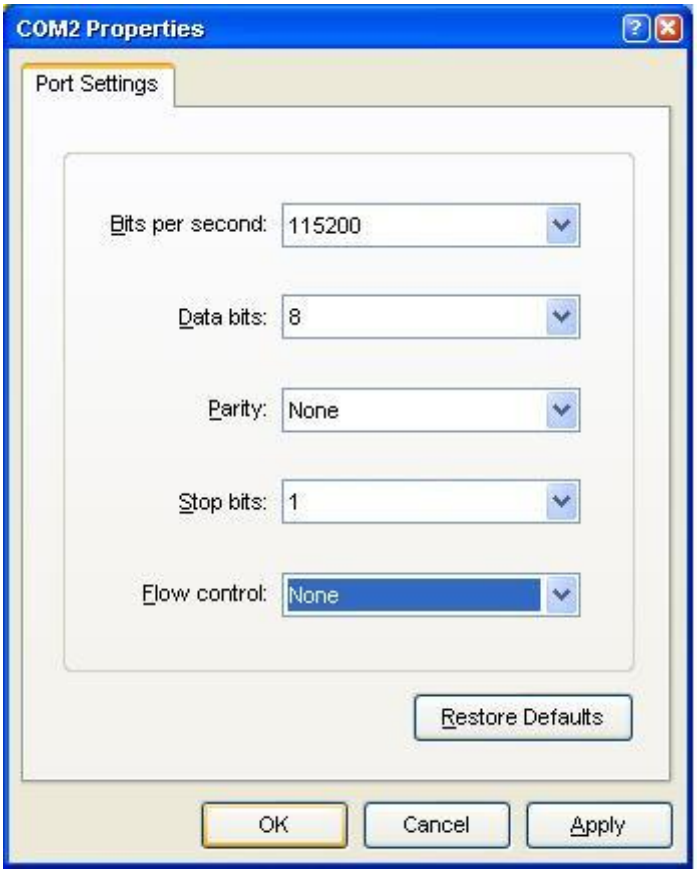


Figure 5: HyperTerminal Connection Settings

5. The following image shows that we have successfully established a Hyper Terminal connection with the PC's serial port:

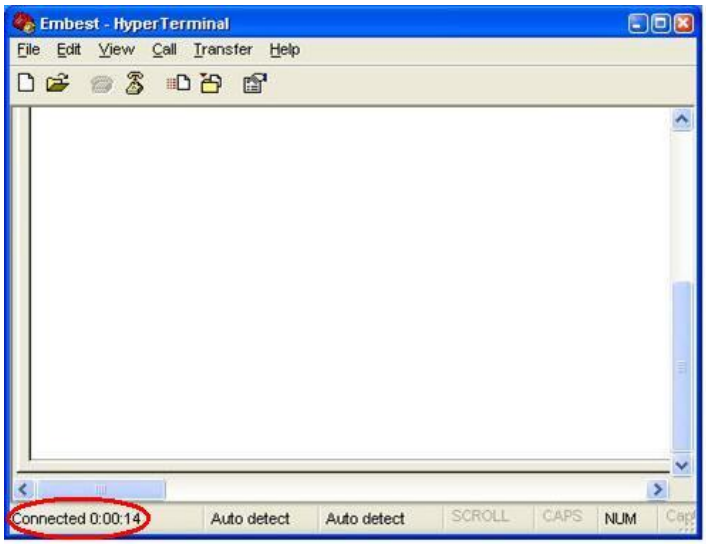


Figure 6: Successful HyperTerminal Connection

Note:

🕮 If you have a 7-inch touch screen, you can change the settings in UBOOT according to the detailed instructions contained in User Manual

Now we have successfully established both a software and a hardware environment for the system. We can turn on the power switch to start the development on SBC8600B.

4 Operating System Quick Start Guide

The SBC8600B supports three operating systems: Linux 3.2.0, WinCE6.0 and Android. This chapter mainly introduces how to switch between different operating systems and how to boot up from a TF card and NAND Flash.

4.1 Quick operation of the Linux system

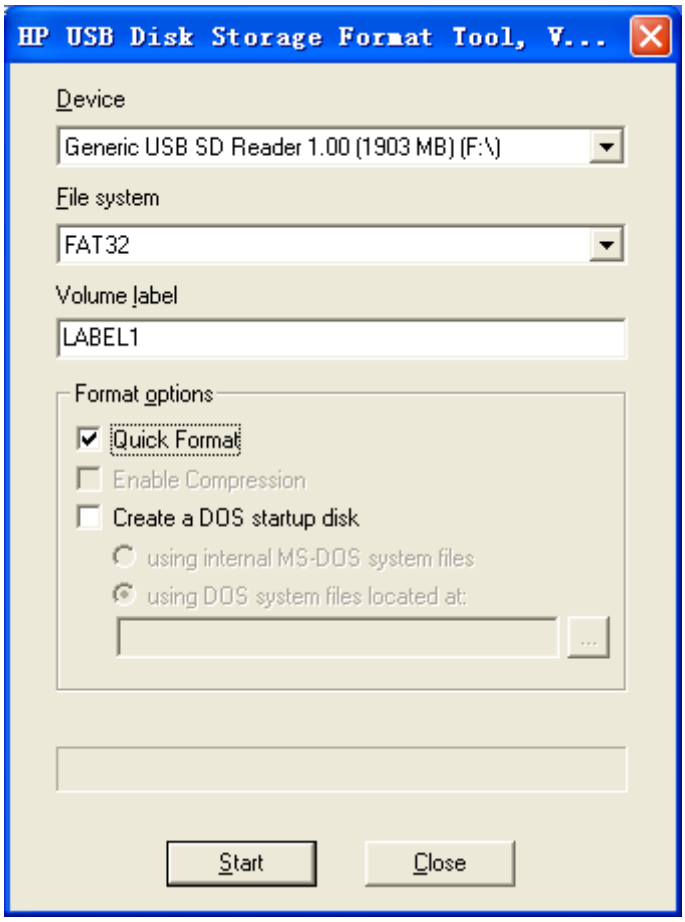
4.1.1 Booting from a TF card

Formatting TF Card

HP USB Disk Storage Format Tool 2.0.6 is recommended as the formatting tool. Please download it from:

http://www.embest-tech.com/resource/download/HP-USB-Disk-Storage-Format-Tool.rar

1. Insert TF card into a card reader and then insert the reader into your PC.
2. Open the HP USB Disk Storage Format Tool to show the following window:



3. Select "FAT32" file system

4. Click "Start"

5. When formatting is complete, click "OK"

Note:

- HP USB Disk Storage Format Tool will erase the partitions of TF card.
- Use other format tool may cause the failure of the TF card booting.

Image Update

Copy all files under the directory linux\image to the TF card, insert it on the board, and then power up the board. The information on serial interface will be shown as below:

Note:

- The default display is a 4.3” LCD. If you are working with LCDs of another size, please enter u-boot when the board is booting up to configure the display mode, and then type boot to continue boot-up process. Please refer to the User Manual for more details
- If there is already an image in NAND Flash, you need to short the jumper **JP5** on the board so as to make it boot up from TF card. Disconnect JP5 after successful boot-up of the system.

```
Booting from MMC...
OMAP SD/MMC: 0
reading u-boot.img
reading u-boot.img


U-Boot 2011.09-svn55 (Dec 04 2012 - 09:29:02)

I2C:   ready
DRAM:  512 MiB
WARNING: Caches not enabled
Did not find a recognized configuration, assuming General
purpose EVM in Profile 0 with Daughter board
NAND:  HW ECC Hamming Code selected
512 MiB
MMC:   OMAP SD/MMC: 0
*** Warning - bad CRC, using default environment

Net:   cpsw
Hit any key to stop autoboot:  0
SD/MMC found on device 0
reading uEnv.txt

** Unable to read "uEnv.txt" from mmc 0:1 **
reading uImage

3224184 bytes read
reading ramdisk.gz

12514633 bytes read
## Booting kernel from Legacy Image at 80007fc0 ...
```

```
   Image Name:   Linux-3.2.0
   Image Type:   ARM Linux Kernel Image (uncompressed)
   Data Size:    3224120 Bytes = 3.1 MiB
   Load Address: 80008000
   Entry Point:  80008000
   Verifying Checksum ... OK
   XIP Kernel Image ... OK
OK

Starting kernel ...

Uncompressing Linux... done, booting the kernel.
Linux version 3.2.0 (luofc@TIOP) (gcc version 4.3.3 (Sourcery
G++ Lite 2009q1-203) ) #17 Fri Dec 7 10:04:07 CST 2012
……
……
RAMDISK: gzip image found at block 0
VFS: Mounted root (ext2 filesystem) on device 1:0.
Freeing init memory: 260K
INIT: version 2.86 booting
Starting udevudevd (741): /proc/741/oom_adj is deprecated,
please use /proc/741/oom_score_adj instead.
tar: removing leading '/' from member names

Remounting root file system...
mount: mounting /dev/root on / failed: Invalid argument
mount: mounting /dev/root on / failed: Invalid argument
root: mount: mounting rootfs on / failed: No such file or
directory
Setting up IP spoofing protection: rp_filter.
Configuring network interfaces... udhcpc (v1.11.3) started
Sending discover...
udhcpc: sendto: Network is down
Sending discover...
udhcpc: sendto: Network is down
Sending discover...
udhcpc: sendto: Network is down
No lease, failing
done.
Tue Jan 27 08:47:00 UTC 2009
INIT: Entering runlevel: 5
Starting syslogd/klogd: done

.-------.
```

```
|      |                .-.
|   |   |-----.-----.-----.| |   .----..-----.-----.
|      |    | __  |  ---'| '--.|  .-'|    |     |
|   |   |  |  |    |---  ||  --'|  |  |  '  | | | |
'---'---'--'--'--.  |-----''----''--'  '-----'-'-'-'
              -'  |
              '---'

The Angstrom Distribution SBC8600 ttyO0

Angstrom 2008.1-test-20090127 SBC8600 ttyO0

SBC8600 login: (Type "root")
```

The above information indicates a successful boot-up of Linux from the TF card.

4.1.2 Boot-up From NAND Flash

Updating of the NAND boot-up image is accomplished by u-boot. Regardless of whether NAND Flash contains data, u-boot can be used to update any NAND Flash images.

Preparation

1. Format the TF card to a FAT or FAT32 file system by using the HP USB Disk Storage Format Tool 2.0.6
2. Copy the files **MLO, u-boot.img, uImage and ubi.img** under the directory linux\image from DVD-ROM into a TF card.

Update

3. Insert the TF card which contains the system images into the development board, and then connect the power supply. Press any key on the keyboard to enter u-boot when the message "Hit any key to stop autoboot" appears:

Note:

- You may short the jumper JP5 on the board to allow SBC8600B boot up from TF card and enter u-boot to write the image in NAND Flash, and then disconnect JP5 to allow system boot up from NAND Flash.
- Alternatively, you may leave **JP5** disconnected and insert the TF card on the board to boot up from NAND Flash, and then write the image in NAND Flash through uboot.

```
U-Boot SPL 2011.09-svn55 (Nov 20 2012 - 10:37:42)
Texas Instruments Revision detection unimplemented
Booting from MMC...
OMAP SD/MMC: 0
reading u-boot.img
reading u-boot.img


U-Boot SPL 2011.09-svn55 (Nov 20 2012 - 10:37:42)
I2C:   ready
DRAM:  512 MiB
WARNING: Caches not enabled
Did not find a recognized configuration, assuming General
purpose EVM in Profile 0 with Daughter board
NAND:  HW ECC Hamming Code selected
512 MiB
MMC:   OMAP SD/MMC: 0
*** Warning - bad CRC, using default environment

Net:   cpsw
Hit any key to stop autoboot:  0 (press any key to enter uboot)
```

4. After entering the u-boot command line, type "run updatesys" to start the update process of the system:

```
SBC8600# run updatesys

NAND erase.chip: device 0 whole chip
Erasing at 0x7fe0000 -- 100% complete.
OK
reading MLO

36079 bytes read
```

```
HW ECC BCH8 Selected

NAND write: device 0 offset 0x0, size 0x8cef
 36079 bytes written: OK
reading u-boot.img

234896 bytes read
HW ECC BCH8 Selected

NAND write: device 0 offset 0x80000, size 0x39590
 234896 bytes written: OK
reading uImage

3224184 bytes read
HW ECC BCH8 Selected

NAND write: device 0 offset 0x280000, size 0x313278
 3224184 bytes written: OK
reading ubi.img

14811136 bytes read
SW ECC selected

NAND write: device 0 offset 0x780000, size 0xe20000
Skip bad block 0x00ce0000
 14811136 bytes written: OK
```

A Flashing LED on the board indicates that the update has been finished; please remove the TF card and reboot the board.

4.1.3 U-boot configuration

The system image is set by default for a 4.3” LCD. You can change the settings in UBOOT by using the instructions contained within the User Manual.

4.2 Quick Operation of the WinCE System

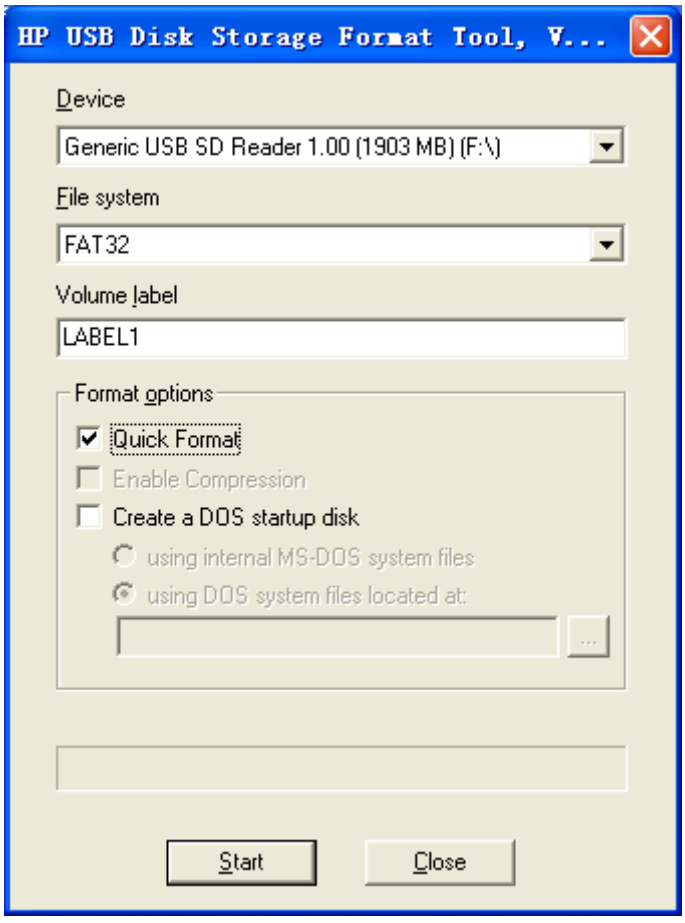
4.2.1 Boot-up From TF Card

Formatting TF Card

HP USB Disk Storage Format Tool 2.0.6 is recommended as the formatting tool. Please download it from:

http://www.embest-tech.com/resource/download/HP-USB-Disk-Storage-Format-Tool.rar

1. Insert TF card into a card reader and then insert the reader into your PC.
2. Open the HP USB Disk Storage Format Tool to show the following window:



3. Select "FAT32" file system
4. Click "Start"

5. When formatting is complete, click “OK”

Note:

- HP USB Disk Storage Format Tool will erase the partitions of TF card.
- Use other format tool may cause the failure of the TF card booting.

Copy Runtime Image

Copy the **MLO, EBOOTSD.nb0 and NK.bin** image files to the TF card. They are located under CD\WINCE700\image

System Boot-up

Insert a TF card, reboot the system from the TF card and press Space in a few seconds to enter to the EBOOT menu as shown below:

6. Enter the EBOOT Menu

```
CCCCCCCC
Texas Instruments Windows CE SD X-Loader33X
Built Jul 27 2012 at 11:25:59
Version BSP_WINCE_ARM_A8 02.30.00.03
open ebootsd.nb0 file
Init HW: controller RST
SDCARD: requested speed 1000000, actual speed 1000000
SDCARD: requested speed 25000000, actual speed 19200000
read ebootsd.nb0 file

jumping to ebootsd image

Microsoft Windows CE Bootloader Common Library Version 1.4 Built
Jul 27 2012 11:23:05
I2C EEPROM returned wrong magic value 0xffffffff
INFO:OALLogSetZones: dpCurSettings.ulZoneMask: 0x8409

Texas Instruments Windows CE EBOOT for AM33x, Built Jul 27 2012
at 11:25:53
EBOOT Version 0.0.1, BSP BSP_WINCE_ARM_A8 02.30.00.03
AHCLKX pinmux:0
AHCLKX CTRL:0x8001
```

```
pin function:0x0
pin dir:0x8000000

TI AM33X

ecc type:3
System ready!
Preparing for download...
INFO: Predownload....
Checking bootloader blocks are marked as reserved (Num = 18)

BOOT_CFG_SIGNATURE is different, read -1, expect 1111705159
WARN: Boot config wasn't found, using defaults
INFO: SW3 boot setting: 0x04
IsValidMBR: MBR sector = 0x480 (valid MBR)
OpenPartition: Partition Exists=0x1 for part 0x20.

>>> Forcing cold boot (non-persistent registry and other data
will be wiped) <<<
e0311800 56e4 -> 0 18 31 e0 e4 56
e0311800 57e4 -> 0 18 31 e0 e4 57
Hit space to enter configuration menu [56] 5...(press SPACE to
enter EBOOT menu)
```

7. Type [2]->[2] to set the board to boot up from the TF card

```
-------------------------------------------------------------
---------------------
 Main Menu
-------------------------------------------------------------
---------------------
 [1] Show Current Settings
 [2] Select Boot Device
 [3] Select KITL (Debug) Device
 [4] Network Settings
 [5] SDCard Settings
 [6] Set Device ID
 [7] Save Settings
 [8] Flash Management
 [9] Enable/Disable OAL Retail Messages
 [a] Select Display Resolution
 [b] Select OPP Mode
 [0] Exit and Continue

 Selection: 2
```

```
-------------------------------------------------------------
--------------------
 Select Boot Device
-------------------------------------------------------------
--------------------
 [1] Internal EMAC
 [2] NK from SDCard FILE
 [3] NK from NAND
 [0] Exit and Continue

 Selection (actual Internal EMAC): 2
 Boot device set to NK from SDCard FILE
```

8. Type [a] to enter "Select Display Resolution" menu and select LCD\LVDS as the output

```
-------------------------------------------------------------
--------------------
 Main Menu
-------------------------------------------------------------
--------------------
 [1] Show Current Settings
 [2] Select Boot Device
 [3] Select KITL (Debug) Device
 [4] Network Settings
 [5] SDCard Settings
 [6] Set Device ID
 [7] Save Settings
 [8] Flash Management
 [9] Enable/Disable OAL Retail Messages
 [a] Select Display Resolution
 [b] Select OPP Mode
 [0] Exit and Continue

 Selection: a

-------------------------------------------------------------
--------------------
 Select Display Resolution
-------------------------------------------------------------
--------------------
 [1] LCD  480x272 60Hz             //For 4.3-inch LCD
 [2] DVI  640x480 60Hz(N/A)
 [3] DVI  640x480 72Hz(N/A)
```

```
 [4] LCD  800x480 60Hz              //For 7-inch LCD
 [5] DVI  800x600 60Hz(N/A)         //For LVDS
 [6] DVI  800x600 56Hz(N/A)
 [7] VGA 1024x768 60Hz              //For VGA
 [8] DVI 1280x720 60Hz(N/A)
 [0] Exit and Continue Selection (actual LCD  480x272 60Hz): 4
```

9. Type [0] to continue the boot-up process

```
-------------------------------------------------------------
--------------------
 Main Menu
-------------------------------------------------------------
--------------------
 [1] Show Current Settings
 [2] Select Boot Device
 [3] Select KITL (Debug) Device
 [4] Network Settings
 [5] SDCard Settings
 [6] Set Device ID
 [7] Save Settings
 [8] Flash Management
 [9] Enable/Disable OAL Retail Messages
 [a] Select Display Resolution
 [b] Select OPP Mode
 [0] Exit and Continue

 Selection: 0
mode = 3
LcdPdd_LCD_GetMode:3
mode = 3
LcdPdd_LCD_Initialize:3
OEMPreDownload: Filename nk.bin
Init HW: controller RST
SDCARD: requested speed 1000000, actual speed 1000000
SDCARD: requested speed 25000000, actual speed 19200000

BL_IMAGE_TYPE_BIN

+OEMMultiBinNotify(0x8feb24d8 -> 1)
Download file information:
-------------------------------------------------------------
[0]: Address=0x80002000  Length=0x03c9e9bc  Save=0x80002000
-------------------------------------------------------------
Download file type: 1
```

```
+OEMIsFlashAddr(0x80002000) g_eboot.type 1
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.............................................rom_offset=0
x0.
..ImageStart = 0x80002000, ImageLength = 0x3c9e9bc, LaunchAddr
= 0x8000b6a0

Completed file(s):
---------------------------------------------------------
--------------------
+OEMIsFlashAddr(0x80002000) g_eboot.type 1
[0]: Address=0x80002000  Length=0x3c9e9bc  Name="" Target=RAM
ROMHDR at Address 80002044h
Launch Windows CE image by jumping to 0x8000b6a0...

Windows CE Kernel for ARM (Thumb Enabled)
CPU CP15 Control Register = 0xc5387f
CPU CP15 Auxiliary Control Register = 0x42
I2C EEPROM returned wrong magic value 0xffffffff
+OALTimerInit(1, 24000, 200)
--- High Performance Frequecy is 24 MHz---
```

4.2.2 Booting-up From NAND Flash

1. Formatting TF card

   Please refer to p17 for instructions

2. Copy runtime image

Copy **MLO**, **EBOOTND.nb0**, **NK.bin**, **XLDRNAND.nb0** and **EBOOTSD.nb0** image files under CD\WINCE700\image to the TF card.

3. Update of NAND Flash image files

Insert TF card, reboot the system from TF card and press Space in a few seconds to enter to the EBOOT menu, and then follow the steps listed below:

- Type [8] to enter the Flash menu;

- Type [9]->[4]->[A], [9]->[3]->[B] and [9]->[2]->[C] to write XLDR, EBOOT and NK images;
- Type [0] to return to the main menu, and then type [2] and [3] to select boot-up from NAND Flash; Type [A] to select LCD/DVI display mode; Type [7] and [y] to save the boot-up settings;

Remove the TF card and reboot the system. The system will boot from NAND Flash.

4.3 Quick Operation of the Android System

The SBC8600B provides an Android system demonstration, please follow the steps listed below:

1. Copy all files under the directory \linux\demo\Android\image of the DVD-ROM to a TF card;
2. Insert the TF card on the board and short jumper JP5, and then power on the board. The debugging tool will show the following information:

```
CCCCCCCC
U-Boot SPL 2011.09-svn55 (Dec 04 2012 - 09:36:25)
Texas Instruments Revision detection unimplemented
Booting from MMC...
OMAP SD/MMC: 0
reading u-boot.img
reading u-boot.img



U-Boot 2011.09-svn55 (Nov 22 2012 - 11:35:28)

I2C:   ready
DRAM:  512 MiB
WARNING: Caches not enabled
Did not find a recognized configuration, assuming General
purpose EVM in Profile 0 with Daughter board
NAND:  HW ECC Hamming Code selected
512 MiB
MMC:   OMAP SD/MMC: 0
*** Warning - bad CRC, using default environment
```

```
NAND erase.chip: device 0 whole chip
Skipping bad block at  0x03620000
Erasing at 0x1ffe0000 -- 100% complete.
OK
reading MLO

36079 bytes read
HW ECC BCH8 Selected

NAND write: device 0 offset 0x0, size 0x8cef
 36079 bytes written: OK
reading flash-uboot.img

234620 bytes read
HW ECC BCH8 Selected

NAND write: device 0 offset 0x80000, size 0x3947c
 234620 bytes written: OK
reading uImage

2719416 bytes read
HW ECC BCH8 Selected

NAND write: device 0 offset 0x280000, size 0x297eb8
 2719416 bytes written: OK
reading ubi.img

72744960 bytes read
SW ECC selected

NAND write: device 0 offset 0x780000, size 0x4560000
72744960 bytes written: OK
```

3. When the writing process is complete, the on-board LED will be flashing. Please remove the TF card and the jumper cap. Power on the board again to load the Android operating system;

Note

🕮 The system is set by default for a 4.3” LCD. You can change the settings in UBOOT according to the instructions contained in the User Manual.

Appendix 1: ESD Precautions & Handling Procedures

Please note that the board comes without any case/box and all components are exposed. Therefore, extra attention must be paid to ESD (electrostatic discharge) precautions. To effectively prevent electrostatic damage, please follow the steps below:

- Avoid carpets in cool, dry areas. Leave development kits in their anti-static packaging until ready to be installed.
- Dissipate static electricity before handling any system components (development kits) by touching a grounded metal object, such as the system unit unpainted metal chassis.
- If possible, use antistatic devices, such as wrist straps and floor mats.
- Always hold an evaluation board by its edges. Avoid touching the contacts and components on the board.
- Take care when connecting or disconnecting cables. A damaged cable can cause a short in the electrical circuit.
- Prevent damage to the connectors by aligning connector pins before you connect the cable. Misaligned connector pins can cause damage to system components at power-on.
- When disconnecting a cable, always pull on the cable connector or strain-relief loop, not on the cable itself.

Warning:

🕮 This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Appendix 2: Technical support & Warranty

Embest Technology Co., Ltd. established in March of 2000, is a global provider of embedded hardware and software. Embest aims to help customers reduce time to market with improved quality by providing the most effective total solutions for the embedded industry. In the rapidly growing market of high end embedded systems, Embest provides comprehensive services to specify, develop and produce products and help customers to implement innovative technology and product features. Progressing from prototyping to the final product within a short time frame and thus shortening the time to market, and to achieve the lowest production costs possible. Embest insists on a simple business model: to offer customers high-performance, low-cost products with the best quality and service.

2.1 Technical support service

Embest provides one year of free technical support for all products. The technical support service covers:

- Embest embedded platform products software/hardware materials
- Assistance to customers with regards to compiling and running the source code we offer.
- Troubleshooting problems occurring on embedded software/hardware platforms if users have followed the instructions provided.
- Judge whether a product failure exists.

The situations listed below are not covered by our free technical support service, and Embest will handle the situation at our discretion:

- Customers encounter issues related to software or hardware during their development process
- Issues occur when users compile/run the embedded OS which has been modified by themselves.

- Customers encounter issues related to their own applications.
- Customers experience problems caused by unauthorised alteration of our software source code

2.2 Maintenance service clause

1. Product warranty will commence on the day of sale and last 12 months provided the product is used under normal conditions
2. The following situations are not covered by the warranty, Embest will charge service fees as appropriate:

- Customers fail to provide valid proof of purchase or the product identification tag is damaged, unreadable, altered or inconsistent with the product.
- Products are subject to damage caused by operations inconsistent with their specification;
- Products are subject to damage in either appearance or function due to natural disasters (flood, fire, earthquake, lightning strike or typhoon) or natural aging of components or other force majeure;
- Products are subject to damage in appearance or function due to power failure, external forces, water, animals or foreign materials;
- Products malfunction due to disassembly or alteration of components by customers, or repair by persons or organizations unauthorized by Embest Technology, or alteration from factory specifications, or configured or expanded with components that are not provided or recognized by Embest Technology;
- Product failures due to the software or systems installed by customers, inappropriate software settings or computer viruses;
- Products purchased from unauthorized merchants;

- Embest Technology takes no responsibility for fulfilling any warranty (verbal or written) that is not made by Embest Technology and not included in the scope of our warranty.

3. Within the period of warranty, the cost for sending products to Embest should be paid by the customer. The cost for returning the product to the customer will be paid by Embest. Any returns in either direction occurring after the warranty period has expired should be paid for by the customer.

4. Please contact technical support with any repair requests.

Note:

🕮 Embest Technology will not take any responsibility for products returned without the prior permission of the company.

2.3 Basic guidelines for protection and maintenance of LCDs

1. Do not use finger nails or other hard sharp objects to touch the surface of the LCD

2. Embest recommends purchasing specialist wipes to clean the LCD after long time use, avoid cleaning the surface with fingers or hands as this may leave fingerprints or smudges.

3. Do not clean the surface of the screen with unsuitable chemicals

Note:

🕮 Embest do not supply a maintenance service for LCDs. We suggest the customer immediately checks the LCD once in receipt of the goods. In the event that the LCD does not run or shows no display, the customer should inform Embest within 7 business days of delivery.

2.4 Value Added Services

We will provide following value added services:

- Driver development based on Embest embedded platforms for devices such as: serial ports, USB interface devices, and LCD screens.
- Control system transplantation, BSP driver development, API software development.
- Other value added services including supply of power adapters and LCD parts.
- Other OEM/ODM services.
- Technical training.

Please contact Embest with any technical support queries:

http://www.embest-tech.com/contact-us.html